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The quality of human capital in South Africa: Evidence from a firm survey

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This paper examines the restrictive nature of human capital in the South African economy, and the impact it has on productivity in the manufacturing sector. These restrictions include an inadequately educated workforce and inflexible labour regulations. Survey analysis along with regression and factor analysis examine the most likely causes of productivity increases. Factor analysis revealed that productivity is driven by three underlying dimensions, namely human capital development, management's competitiveness and location. Human capital development was also shown to be inadequate in small and medium-sized establishments.

Key words: South Africa, human capital constraints, workforce education, labour regulations, survey analysis.

INTRODUCTION

This study investigates the level, quality and especially constraints of South Africa's human capital. For the South African economy to expand on its current economic status, several actions are needed to improve the quality of human capital in the country. Budget allocations towards education and training in the region of 20%, for the past decade, signal South Africa's government's strong intention towards human capital development. Several reports and studies imply, however, that an inadequately educated workforce and restrictive labour regulations are the biggest threats to South Africa's international competitiveness. Evidence on this was revealed in recent Global Competitiveness reports (Schwab et al., 2006)and research done by Bhorat and Lundall (2004), Chandra et al. (2001), Fedderke (2005), Rogerson (2008) and the World Bank (2006) report on Governments' effectiveness in enterprise promotion.

Fedderke (2006), states that in South Africa human capital accumulation contributes little towards economic growth and that the lack of quality education plays a major role in this phenomenon. Several other studies show that the South African regulatory environment is more complex and costlier than in other developing economies. Work done by Rogerson (2004); Godfrey et al. (2007); Benjamin (2008) and Kleynhans and Labuschagne (2012) explore this aspect intensively. The aim of this paper is to determine the austerity of these human capital constraints, and its influence on firms in the South African manufacturing sector.

EDUCATION AS HUMAN CAPITAL

Griliches (1997) states that economic growth accountants like Fabricant and Solow observed the following in terms of economic growth during the middle part of the twentieth century. Economic growth is not only explained by conventional labour and capital measures. These accountants speculated that the changing quality of the labour force might be a crucial component in explaining the difference in wage, income and output distribution between countries. To explain how investment in education forms part of human capital, Schultz (1960) proposed the following: "Treat education as an investment in man and the consequences as a form of capital", which is human capital. Empirical evidence also suggests that educational improvements in the United States labour force in the late nineteen eighties and early nineties, accounted for a 0.5% aggregate output growth

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per year. These educational improvements also represented a third of the total factor productivity (TFP) residual (Griliches, 1999).

The neo-classical growth theory explains that technological innovation is an exogenous variable that explains economic growth (Cypher and Dietz, 2009). Technological innovation depends on man, as it cannot function on its own. This paper argues that the quality of a country's human capital determines the rate of technological innovation, and it is this rate of technological progress that ultimately leads to increased economic growth. Countries that achieve rapid advances in technological innovation share similar economic fundamentals that enable them to converge to higher incomes. Colander and Gamber (2002), state that the unequal quality of labour is one of the reasons for non-convergence in income between countries. Barro (2001) explains that education can influence human capital in two ways. The first is in a quantitative approach (number of years of schooling), and the second a qualitative approach (competitiveness of schooling). If an improved level of educational attainment does not impact on economic growth or development, what happened to the educated labour and what is the utility of school expenditure? Dessus (2001) explains that the difference in quality education is explained by the ability to produce one marginal unit of productive human capital. A productive unit of human capital contributes to an increase in GDP or output. The elasticity of GDP, with respect to human capital, also varies between countries and this explains the weak contribution that human capital has on growth in some developing countries. The result is that the difference in educational infrastructure and quality explains the difference in the marginal productivity across countries. It is this same idea that will be investigated on a firm level in this paper, and one would expect the level of education to have a positive relationship with output per worker between firms. For the purpose of this paper, output per worker will be referred to as productivity.

Education in South Africa

Since 1998, education in South Africa annually received the biggest fraction of the national budget (South Africa. National Treasury, 2010). If the possibility of an inadequately educated workforce exists, the reason for this could not be an insufficient resource allocation or shortage of funding. Bloch (2009) states that close to 80% of schools in South Africa do not have library facilities.

Only 69% of schools have access to a constant water supply and 83% to electricity. The lack of libraries, sanitation, electricity and computers also deprives learners of valuable resources that could assist them in the learning process. Bloch (2009) highlights the following about the performance and trends in South

African schools and universities: A small band of 20% of schools produces the majority of university graduates in South Africa. Only 50% of kids in rural or township schools finish school, and Grade 9 is seen as the major drop out point in these schools. When looking at the performance among university students, almost 50% never finish their degrees. 45% leave university without graduating and 66% of university of technology students leave without finishing their studies.

Official tests conducted by the department of education in 2007 revealed an average score of 35 % for numeracy and 36% for literacy among grade 3 learners (DoE, 2008). The International Mathematics and Science Study (TIMSS) report indicates that South African learners occupied the bottom positions in both mathematics and science in the 1999 and 2003 reports (TIMSS, 2003). The South African average was also 44% below the report average in 2003.

In Barry and Taylor (2006), the Southern and Eastern African Consortium for Monitoring Educational Quality (SAQMEQ) report published in 2005 indicates that Grade 6 learners in South Africa performed worse than learners in African countries with fewer resources. South Africa came ninth out of thirteen African countries partaking in the survey. These scores indicate a serious lack of understanding of mathematics and literacy among South African learners.

Evidence from the survey

The preceding work showed that the possibility of a poorly educated workforce might exist. This section will explore the level of education among workers in the survey conducted by the World Bank (2008) on firm-level. Figure 1 indicates that the level of education among production workers is evenly matched. The majority of production workers in small, medium and large establishments have between seven and twelve years of education. When the level of education for managers is analysed, it becomes clear that managers working in larger firms are on average higher educated than those working for small and medium-sized establishments.

It was explained earlier that educational attainment is closely associated with human capital formation. It was found that South Africa's education system is ineffective in distributing quality educational infrastructure and services. The schooling system produces a mass of inadequately educated learners who are unable to compete with learners in other developing countries. Firm-level evidence suggests that the educational level of managers is highly correlated with the size of the establishment they work for. Most production workers have some form of educational background, but less than ten per cent have more than twelve years of education. The scales used in gathering the data also make it difficult to determine the fraction of production workers that have completed their high school education.
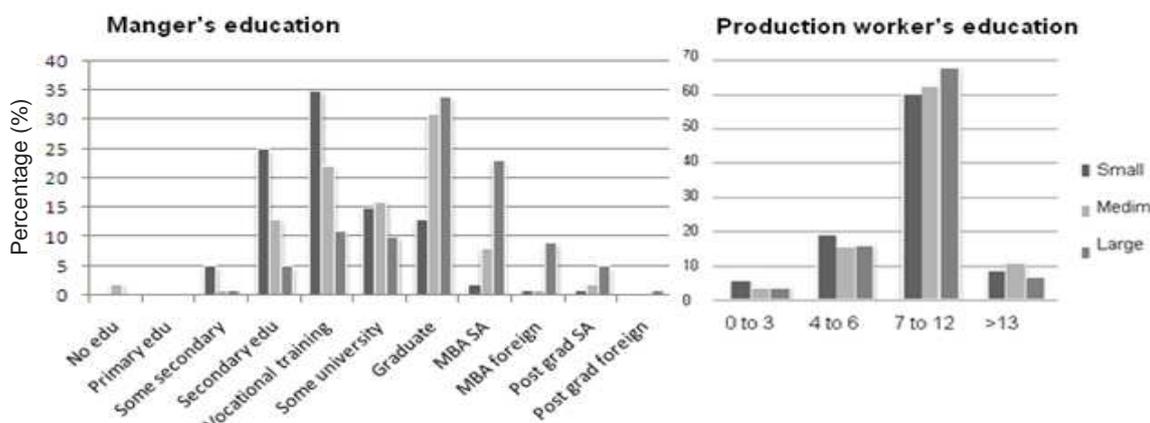
Figure 1. Average education of managers and production workers. Source: World Bank Survey and authors' own calculations.

Table 1. Additional labour legislation.

Prevention of workplace Injury	Social security	Skills development and training
-Occupational Health and Safety Act (OHSA)	-Compensation forOccupationalInjury and Disease Act (COIDA)	-Skills Development Act (SDA)
-Mine Health and Safety Act (MHSA)	-Occupational Disease in Mines and Works Act (ODMWA)	-Skills Development Levies Act (SDLA)
-	Unemployment Insurance Act (UIA)	-
-	Pension and Health regulations	-

Source: Basson et al. (2009).

RESTRICTIVE LABOUR REGULATIONS

Along with an inadequately educated labour force, restrictive labour regulations have also been cited as a major human capital constraint in South Africa (Kleynhans, 2006). This focuses on various distortions in the South African labour market. The two types of labour market distortions that receive attention are labour laws and inappropriate bargaining institutions.

Labour legislation

The labour law is legislative in nature and the main focus is on job security and the establishment of minimum basic conditions for employees. Two main relationships exist in this environment; the first one is the individual relationship between employer and employee. The second one refers to a wider relationship between employers, a group of employees, trade unions and employer organisations.

Basson et al. (2009), state that the main labour legislation in South Africa has three fundamental elements. The Labour Relations Act of 1995 (LRA), the

Basic Conditions of Employment Act of 1997 (BCEA) and the Employment Equity Act of 1998 (EEA). Additional acts can be divided into three categories, as seen in Table 1. These acts all aim at improving the workplace environment, providing social security and facilitating skills development.

Labour regulations in South Africa are perceived to be complex and cover a range of aspects in the legislative environment. Rogerson (2008), states that South Africa's regulatory compliance cost is higher than in other developing country. International experience also indicates that flexible labour market characteristics are one of the main determinants in employment and productivity creation (Nattrass, 2003). Labour regulations can be restrictive in two ways; firstly, it restricts workers from entering the formal labour market. Secondly, these restrictive regulations deter employers from employing additional workers. Measuring unemployment in South Africa is extremely difficult. Data on the size of the informal economy is not reliable, and available data suggests low levels of informal employment. In the literature, there are two distinctive measures of describing the level of South Africa's unemployment. These are the "narrow" and "broad" unemployment

Table 2. Collective bargaining framework.

The statutory system	The non-statutory system
Bargaining council Number: 84 councils Trends: - most common - centralised negotiations Enforce: Commission for Conciliation, Mediation and Arbitration (CCMA)	**Non-statutory centralised bargaining** Trends:3 industries only - mining: central bargaining forums - automobile: National Bargaining forum (NBF) - fishing: yearly forum and firm-level negotiations
Statutory council Number: 2 Trends: - increased establishment - serve as dispute resolution agencies	**Non statutory decentralised bargaining** Trends: retail sector - individual firm-level bargaining - sector-specific agreements
Quasi-Statutory centralised bargaining Number: unknown Trends: - only security and cleaning sectors - centralised negotiations- ministerial intervention on behalf of non-members	

Source: Constructed from Godfrey et al. (2007).

measures. Narrow unemployment refers to those individuals actively searching for formal work. While broad unemployment represents individuals who are available to work, but not actively searching for formal work. Between 1995 and 2005, the unemployment rate in South Africa has increased from 17.6 -26.7% for the narrow definition, and from 30.8 - 38.8%for the broad definition (Bhorat, 2008). During 2011, narrow unemployment was 24% (Stats SA, 2011). The large gap between narrow and broad unemployment and high levels of unemployment for both measures indicate labour market failure. In this way, labour regulations do seem to contribute to employment rigidity in South Africa.

Employees in the formal sector are seen as insiders, as they are within the regulatory framework of labour union activities. The trade unions through collective bargaining can protect workers against unfair dismissal, inadequate working conditions and real wage fluctuations. Kingdon and Knight (2007) found that the ratio of formal to informal sector monthly income was 3.4:1 in 2003. This indicates that collective bargaining serves as real wage resistance in the formal labour market. Workers in the formal sector also receive added benefits such as medical cover, pensions and annual leave. Fundamental differences between formal and informal sector wages and benefits are yet again another indication of labour market failure.

OECD evidence indicates that countries that implement macro-economic stabilisation policies without addressing labour market rigidity, encountered employment difficulties (Nattrass, 2000). This is evident in South Africa's case. Since 1994, the most prominent macro-economic stabilisation policy has been the Growth Employment and Redistribution strategy (GEAR), and as previous evidence shows, South Africa also encountered employment difficulties.

Inappropriate bargaining institutions

Analysis of the data from the firm-level survey conducted by the World Bank (2008) revealed that both individual and collective parties in the labour market make use of bargaining institutions to converse on a variety of aspects surrounding labour. From the various elements in the legislative environment, employer and employee organisations negotiate industry- or firm-specific labour practices. The collective bargaining framework given in Table 2, shows that bargaining exists in both the statutory and non-statutory environments. Bargaining practices also differ between sectors and negotiations tend to be more centralised in the manufacturing and mining sector, while decentralised in the retail sectors.

Moll (1996), states that large firms use more capital intensive techniques to increase productivity, and as a result wages are higher than in smaller firms. In South Africa, bargaining councils are dominated in larger firms, therefore wage bargaining is perfect for capital intensive sectors, but not labour intensive sectors. This harms the labour intensive smaller firms and contributes to
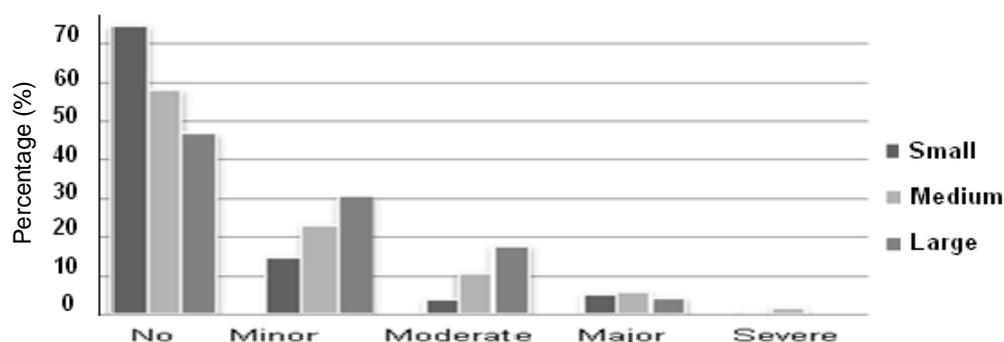
Figure 2. Labour regulations as an obstacle. Source: World Bank Survey and authors' own calculations.

employment rigidity. In this way, collective bargaining impacts negatively on smaller firms in the economy, and proves that centralised bargaining can be inappropriate in certain sectors. Godfrey et al. (2007), state that the worst trend is the increase in industrial action, where intimidation and violence are on the rise. Statutory councils are ineffective and are being marginalised to dispute resolution entities. Another negative aspect is that it seems as if bargaining institutions are not promoting training and development activities in any of the industries.

Experience suggests that labour legislation in South Africa contributes to employment rigidity and an increase in the cost of employing additional workers. Next, the effect that labour regulations have on manufacturing firms in the country will be assessed.

Evidence from the survey

To determine if labour regulations pose a real constraint to manufacturing firms in South Africa, the survey considered the severity of the impact of labour regulations on businesses, and these results are shown in Figure 2.

From the 720 firms in the analysis, the majority indicated that labour regulations do not pose as a definite obstacle when doing business. However, large firms find labour regulations more restrictive than small and medium-sized establishments. Employment growth for the period 2003 - 2006 was 131% for small establishment, followed by 29% for medium-sized establishments and 9% for large establishments. Large firms did not indicate labour regulations as being extremely restrictive, but employment figures suggest the opposite. The survey also found that small and medium-sized establishments mainly operate in sectors where bargaining has become decentralised. This might imply that the decentralisation of the bargaining process can contribute to employment creation and increased productivity in certain sectors. To conclude; labour

regulations do seem to contribute to some form of labour market distortion. However, survey evidence suggests that these regulations have a less restrictive effect on smaller manufacturing firms in the country.

REGRESSION ANALYSIS ON PRODUCTIVITY

This analysis is based on data gathered by the World Bank enterprise survey on productivity and investment climate in South Africa. The survey targeted establishments located in the cities of Johannesburg, Cape Town, Port Elizabeth and Durban in the industries of manufacturing, construction, retail, hospitality, transport, storage, communication and computer-related activities. In this particular study, the analysis focused on manufacturing establishments and therefore, wholesale, retail, hotel and information technology establishments were eliminated from the dataset. This demarcated the research area sufficiently and made the subject matter more manageable. For the purpose of this paper, a sample of 720 establishments was used to analyse determinants of increased productivity among South African manufacturers.

Estimation of the model

The dependant variable in these regressions was productivity (total sales/total workforce). The independent or explanatory variables coincide with the work considered earlier. Variables that represent educational attainment and labour market distortions were compiled and used in the regression analysis. Some of the explanatory variables were further divided into categories, and dummy coding was used to distinguish between them.

The method of ordinary least squares was applied in the estimations, using the empirical computer software package SPSS, selecting the Stepwise Method (backward mode) of regression analysis. The coefficient of regression R^2 indicates that 48% of the variability of

Table 3. Regression coefficients.

	b	Std. error	Reference group
Constant	**1.904**	**0.214**	
Managers' education			
Secondary education	-0.073	0.077	
Training	-0.022	0.073	
Some university	0.066	0.077	
Graduate	0.136	0.074	Primary education
MBA (South Africa)	0.191*	0.082	
MBA (foreign)	0.097	0.102	
Post-graduate (South Africa)	0.157	0.110	
Post-graduate (foreign)	0.341	0.215	
Labour regulations			
Minimal obstacle	-0.025	0.035	
Moderate obstacle	-0.059	0.048	No obstacle
Major obstacle	0.039	0.064	
Severe obstacle	0.052	0.136	
Production workers education			
4 to 6 years	-0.006	0.070	
7 to 12 years	0.044	0.064	0 to 3 years
>13 years	-0.057	0.075	
Training			No training
Yes	-0.013	0.034	
SETA support			No support
Yes	0.116	0.087	
SETA effectiveness			
Very effective	-0.273*	0.116*	
Effective	0.044	0.106	Very ineffective
Neither effective nor ineffective	0.074	0.061	
Ineffective	-0.063	0.100	
Compensation			
Production workers	0.635*	0.056*	
managerial workers	0.254*	0.055*	
Location			
CT	0.117*	0.053*	
JHB	0.216*	0.044*	KZN
PE	0.112	0.063	
Competition			
1	0.178*	0 .070*	
2 to 5	0.085	0.048	0 competitors
>5	0.115*	0.046*	

Note: R^2 = 48% and significant at $p<0.005$.

productivity (output per worker) is explained by the explanatory variables in this model. The model also satisfies all the classical linear regression model assumptions. Table 3 provides a summary of the

regression coefficients. The b-values will be used to explain the results obtained from this regression. Variables with an asterisk (*) next to it, indicate that the specific variable is significant at a 5% level of significance (or p<0.05). This shows that the b-value is significantly different from zero, and not equal to zero as described in the null hypothesis.

REGRESSION RESULTS

Education

The education variable was evaluated using dummies. The reason for this is to clearly distinguish between the levels of education. The b-values show that compared to managers with primary education, secondary education and training are negatively related to the dependant variable (productivity). Higher education seems to be positively related to the dependant productivity variable, but only the MBA (Masters Degree of Business Administration in South Africa) dummy is significant.

It was shown that on average, production workers in small, medium and large firms have between seven and twelve years of education. This explains why relative to the reference group of zero to three years of education, production workers with between seven to twelve years of education contribute positively to productivity. It is unclear why workers with more than thirteen years of education do not have a positive relationship with the dependant variable. None of these dummies are, however, statistically significant.

Labour regulation

It was shown that on average labour regulations do not pose as a major obstacle. The coefficients suggest that when labour regulations pose as a minimal or moderate obstacle, the dependant variable decreases. Large firms were also shown to experience more difficulties with labour regulations than small and medium-sized firms. The positive relationship between labour regulations as a major obstacle and the dependant productivity variable might be explained by the fact that large firms are better equipped to deal with labour regulations. However, none of these variables are significant at the five per cent level and these assumptions are made without absolute certainty.

Training and Sector Education and Training Authority (SETA) support

For large establishments, 26.5% of the respondents experienced Sector Education and Training Authority (SETA) support, while for small and medium-sized establishments; this figure was 4.8 and 11.8%, respectively. The existence of training programmes showed a negative relationship with the dependant

productivity variable, while SETA support has a positive relationship. These variables are both statistically insignificant. It is therefore unclear whether the presence of training programmes or SETA support really influences the dependant variable. Evidence from the data suggests that large firms experience more support from SETA, and are more likely to have official training programmes. Only 27.4%of small firms in the survey have formal training programmes, compared to 47.4 and 70.8% for medium and large establishments, respectively. Due to a lack of response on questions relating to training expenditure, estimating average expenditure figures for this study was difficult. However, expenditure on training seemed to be clustered between one and 2% of total sales.

The coefficients show that SETA effectiveness varies a lot. SETA support that is neither effective nor ineffective contributes to the biggest increase in productivity. An interesting point is that SETA support that is labelled as being "very effective" has a negative relationship with the dependant variable, and is statistically significant. SETA support that is ineffective also has a negative relationship with the dependant variable, but this coefficient is not statistically significant.

Compensation, competition and location

Both the compensation variables have a positive relationship with the dependant productivity variable, and are statistically significant. The data suggests that increasing the level of compensation for production workers will lead to higher productivity levels than for managerial workers. The study also found a large compensation differential between workers and managerial workers in production sectors of the survey.

The competition variable suggests that productivity is the highest in firms that only have a single competitor. Where there are more than five competitors in the same market, a positive relationship also exists with the dependant variable. This is probably due to the factors of competitiveness (Porter, 1998) and spillover effects (Kleynhans and Swart, 2012). This relationship is also statistically significant, but smaller than the first scenario. Where competition takes place between two to five firms, the coefficient is positive but not statistically significant. The coefficients also show that compared to the city of Durban, firms in Johannesburg and Cape Town are more productive. These dummy variables are also both statistically significant. Manufacturing output in this survey is especially location biased. Manufacturing firms in Johannesburg achieved much higher levels of output per worker (productivity) than those in the other three cities.

Underlying dimensions of increased productivity

Factor analysis was used to measure aspects that could not directly be measured. This   analysis determines

Table 4. Rotated component matrix.

	Factors		
	1	**2**	**3**
Training supported by SETA	0.930		
Formal training	-0.861		
SETA effectiveness	0.833		
Manager's education		0.732	
Mangers compensation		0.664	
Number of competitors		-0.592	
Labour regulations			
Region			0.964

Note: KMO and Bartlett's test = 0.677.
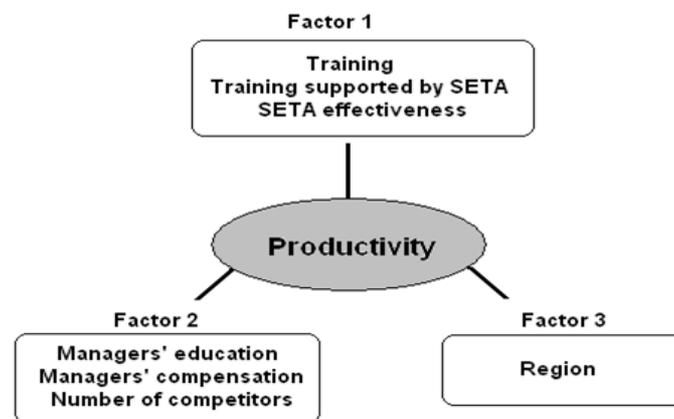
Figure 3. Underlying dimensions. Source: World Bank Survey and authors' own calculations.

whether different variables are driven by the same underlying variables or dimensions. This same variables applied earlier was also used, and aims to identify groups or clusters of variables. After running the analysis in the SPSS empirical software programme, the KMO and Bartlett's test produced a score of 0.677. Field (2007) suggests that a score of close to point seven is an acceptable score for this type of test. After factor extraction, the rotation sums of squared loadings indicate that three factors are present. These three factors also cumulatively explain 60.7% of the total variance. Factor 1 explains 29.6% of the total variance, while factors 2 and 3 explain 18.5 and 12.6% of the total variance, respectively.

After selecting an orthogonal rotation, the rotated component matrix was estimated. This matrix shows the factor loadings for each variable onto each factor. Note that there is no factor loading for the variable labelled "labour regulations". This is because factor loadings of less than 0.4 are not displayed. This variable does not load onto any of the three factors, and has little or no connection with the other variables. The variables are also listed according to the size of their factor loading. Field (2007) explains that variables that measure the same underlying dimension or different aspects of the same dimension should not be entered into the analysis simultaneously. Therefore, production workers' level of education and compensation were omitted from the analysis due to its similarity with mangers' education and compensation. Table 4 shows the tree factors and the variables associated with them.

The next step was to identify common themes for the three factors. The variables that load onto factor 1 all seem to relate to training and SETA involvement. Variables that load onto factor 2 relate to the level of the mangers' education, compensation as well as the number of competitors. Only one variable loads onto factor 3, and this involves region. Next, the three underlying dimensions were labelled according to the common themes of the explanatory variables that clustered

together. Factor 1 was labelled as "human capital development", factor 2 as "management's competitiveness", and the third factor as "region". The underlying dimensions are illustrated in Figure 3. Factor analysis showed that productivity in manufacturing firms in the survey can be explained by the three underlying dimensions: human capital development, management's competitiveness and region.

SUMMARY AND CONCLUSION

This paper explored the role of education and labour regulations in the productivity environment of the South African manufacturing sector. The aim of the paper was to establish whether these two aspects have an influence on productivity levels. It explained that the consequences of investing in education are a form of capital, called human capital. The changing quality of the labour force was also shown to be a crucial component in explaining the difference in wage, income and productivity between countries. Although the results of learners in South Africa are relatively low compared to other developing economies, there is no evidence to suggest that workers in the survey are inadequately educated. Empirical evidence indicated that there is a positive relationship between educational attainment and productivity. Managers with higher levels of education and training achieved higher levels of output. Human capital development was shown to be lacking, especially in small and medium-sized establishments. There is also no clear evidence to suggest that human capital development initiatives such as training and Sector Education and Training Authority (SETA) support increase the productivity of firms in the manufacturing sector.

The majority of firms in the survey indicated that labour regulations do not impact on their productivity. Large firms indicated that they find labour regulations a slightly bigger obstacle than small and medium-sized establishments, and their labour force growth figures confirm this. From this, one can conclude that labour regulations contribute to employment rigidity in the manufacturing sector. However, the impact these regulations have on productivity remains uncertain. Productivity is the highest in the city of Johannesburg, followed by Cape Town and Port Elizabeth. Apart from industries where cartels or monopolies exist, industries with more than five active firms experienced the highest level of productivity, as measured by output per worker. Factor analysis revealed that productivity can be explained by the three underlying dimensions: Human capital development, management's competitiveness and region.

This study found that the level and quality of human capital in South Africa are insufficient to support modern industrial development, especially on micro-economic firm level. Several constraints and challenges still exists that need attention. Another aspect that needs attention

is the unavailability of reliable data on human capital development, and the absence of measures to assess human capital formation and quality education. Further studies on these aspects would contribute to a greater understanding of human capital, and its involvement in the economy.

REFERENCES

Barro RJ (2001). Human Capital and Growth. Am. Econ. Rev., 91(2): 12-17.

Barry D, Taylor N (2006). A Partnership to Improve Literacy. Joint Edu. Trust Bull., 14: 10.

Basson AC, Christianson MA, Dekker A, Garbers C, Le Roux PAK, Mischke C, Strydom EML (2009). Essential Labour Law. 5th ed. Centurion: Labour Law Publications.

Benjamin P (2008). The Regulatory Environment and its Impact on the Nature and Level of Economic Growth and Development in South Africa. Development Policy Research Unit: University of Cape Town. p. 42.

Bhorat H, Lundall P (2004). Employment, Wages and Skills Development: Firm-Specific Effects- Evidence from a Firm Survey in South Africa. S. Afr. J. Econ., 72(5): 1023-1056. Dec.

Bhorat H (2008). Unemployment in South Africa: Descriptors and Determinants. Presentation to the Commission on Growth and Development Washington, DC: World Bank. p. 28.

Bloch G (2009). The Toxic Mix. What's wrong with South African Schools and How to fix it. Cape Town: Tafelberg. p.192

Chandra V, Moorty L, Nganou JP, Rajaratnam B, Schaefer K (2001). Constraints to Growth and Employment in South Africa. Report No. 2: Evidence from the Small, Medium and Microenterprise Firm Survey. Discussion Paper No. 15, Southern Africa Department. Washington, DC: World Bank.

Colander DC, Gamber EN (2002). Macroeconomics. New Jersey: Prentice Hall., p. 464.

Cypher JM, Dietz JL (2009). The Process of Economic Development. 3rd ed. Abingdon: Routledge. p. 613.

Department of Education (DoE) (2008). The 2007 Grade 3 Systemic Evaluation. Pretoria: DOE.

Dessus S (2001). Human Capital and Growth: The Recovered Role of Education Systems. The World Bank: Social and Economic Development Group. Working Paper 2632.

Fedderke JW (2005). Technology, Human Capital and Growth. Working paper nr. 27. School of Economics. Cape Town: University of Cape Town.

Fedderke JW (2006). From Chimera to Prospect: South African Sources of and Constraints on Long Term Growth, 1970-2000. Policy paper nr. 1. School of Economics. Cape Town: University of Cape Town.

Field A (2007). Discovering Statistics Using SPSS. 2nd ed. London: Sage Publications p. 821.

Godfrey S, Theron J, Visser M (2007). The State of Collective Bargaining in South Africa: An Empirical and Conceptual Study of Collective Bargaining. Working paper 07/130Labour and Policy Enterprise Research Group. Cape Town: University of Cape Town.

Griliches Z (1997). Education, Human Capital and Growth: A Personal Perspective. J. Labour Econ., 15(1): 330-344.

Kingdon G, Knight J (2007). Unemployment in South Africa, 1995-2003, Causes, Problems and Policies. J. Afr. Econ., 16(5): 813-848.

Kleynhans EPJ (2006). The Role of Human Capital in the Competitive Platform of South African Industries. S. Afr. J. Hum. Res. Manag., 4(3): 55-62.

Kleynhans EPJ, Swart A (2011). Knowledge Spillover Effects on Competitiveness and Growth within the Manufacturing Industry of South Africa. Afr. J. Bus. Manag., 6(10): 3699-3705

Kleynhans EPJ, Labuschagne R (2011). Human Capital Constraints in South Africa: A Firm Level Analysis. Manag. Global Transit. Int. Res. J., 10(1):71-88

Moll P (1996). Compulsory Centralisation of Collective Bargaining in South Africa. Am. Econ. Rev., 86(2): 326-329.

Nattras N (2000). Is South Africa's High Productivity Growth Strategy

Appropriate in a Labour Surplus Economy? Paper presented at the TIPS Annual Forum, Muldersdrift. p .25.

Nattrass N (2003). Unemployment and AIDS: The Social-Demographic Challenge for South Africa. CSSR working paper 43. Centre for social science research. Cape Town: University of Cape Town. p. 23.

Porter ME (1998). The Competitive Advantage of Nations. New York: Palgrave Macmillan. p855.

Rogerson CM (2004). The Impact of the South African Government's SMME Programs: a Ten-year Review (1994–2003). Dev. S. Afr., 21(5): 765-784.

Rogerson CM (2008). Tracking SMME Development in South Africa: Issues of Finance, Training and the Regulatory Environment. University of the Witwatersrand. Urban Forum, 19: 61-81.

Schultz TW (1960). Capital Formation by Education. J. Polt. Econ., 68(3): 571-583.

Schwab K, Porter ME, Lopez-Claros A (2006). The Global Competitiveness Report. World Economic Forum. New York: Palgrave. p. 608.

South Africa National Treasury (2010). Budget 2010: Budget Speech. Pretoria: National Treasury. p. 30

StatsSA (2011). Official Indicators, Statistics South Africa, Pretoria, www.statssa.gov.za Accessed 15 Nov., 2011.

TIMSS-Report (2003). Trends in International Mathematics and Science Study. http://nces.ed.gov/timss/. Date of access: 20 Nov. 2010.

World Bank (2006). South Africa: Enhancing the Effectiveness of Government in Promoting Micro, Small and Medium Enterprise. Report for the Department of Trade and Industry, Pretoria.

World Bank (2008). World Bank Enterprise Survey on Productivity and Investment Climate in South Africa. http://enterprisesurveys.org/. Accessed 16 Nov 2011.